TRANSPERITONEAL URETEROLITHOTOMY. REPORT OF A CASE IN WHICH THE STONE WAS LOCATED BY THE X-RAY.

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Miss M. H., aged twenty-three years, white, a timekeeper in a rubber factory, consulted me, April 7, 1900, for severe paroxysmal pain in the abdomen, accompanied by vomiting, for which she had been treated for some time without relief. On the 12th, in response to a summons, I saw her, and found her suffering with severe pain over the right side, both anteriorly and posteriorly in the loin, with transmission of the same pain in the line of the right ureter. On palpation marked tenderness was noted over the right kidney and in the line of the ureter. She complained bitterly of a burning sensation at the external urethral orifice. She was vomiting severely at short intervals a greenish colored mucus, small in amount. The above symptoms lasted with varying degrees of intensity for about forty-eight hours, and were then succeeded by a dull aching in the loin, with slight pain on deep pressure over the kidney. During the attack she voided very little urine, but on its cessation she passed a considerable quantity. The first urine passed after the paroxysm showed the following: Acid in reaction, color pale yellow, specific gravity 1020, and contained about one-tenth by bulk of albumen. Microscopically, a few pus cells, some red blood-corpuscles, many vaginal and vesical epithelial cells, some phosphatic crystals, no uric acid or oxalate of lime crystals.

The family history was negative. No tuberculosis or rheumatism. The patient herself had always been well up to the time of her present illness. The first attack of colic occurred in January, 1899, which confined her to bed for about one week, and was thought to be appendicular in origin.

She had no further attacks until January, 1900, and from that time on she began to have them again and again at short intervals, usually a week between at first, and finally only a few days. During these attacks there was usually a great desire to void urine; but when the pain was severest she could void none until it ceased, when a large quantity would be voided. No blood was noted during any of these attacks.

It was suggested to her that a radiograph of the kidney be taken in order to confirm the diagnosis of renal calculus; and for this purpose she was referred to Dr. Charles L. Leonard, at the University Hospital, Philadelphia, on April 20, 1900. A radiograph of both kidneys and pelvis, so as to include ureters and bladder, was made. "The technique employed for this purpose was that described in Dr. Leonard's paper in the ANNALS OF SURGERY, February, 1900, and consisted essentially in the employment of a self-regulating tube set to run at a one-and-one-half-inch vacuum. The tube was fourteen inches above the plate over the last lumbar vertebra, that is, in the axial line of the pelvis. The exposure was ten minutes." A study of the radiograph showed both kidneys to be free from calculi, but at a level with the brim of the pelvis on the right side in the line of the ureter a calculus was found.

She was admitted to St. Francis's Hospital, May 4, 1900, for removal of the stone, which she earnestly desired, as it was making her life miserable owing to lumbar pain and distress, and she was losing strength and flesh, having lost since January 1, 1900, ten pounds of a mean weight of ninety-six pounds, and was also unfitted from following her usual employment.

On May 5 she was etherized and an attempt made to favor the passage of the stone by dilatating the vesical end of the ureter, but, owing to inexperience, the vesical opening of the ureter was not located. However, the stone could be felt through the roof of the vagina and through the rectum bimanually high up on the postero-lateral wall of the pelvis below the iliac vessels by following up the vesical end of the ureter, until it was found to thicken, and an oblong body was felt which, when attempts were made to fix it, only faded away. Transperitoneal ureterolithotomy was chosen for the attack on the stone, owing to its being the easiest method, and because of the very small amount of pus in the urine, rendering the risks of peritoneal infection very

small. This procedure was carried out under ether anæsthesia, May 8, 1900, at 10.30 A.M., with the assistance of Dr. R. R. Rogers, Jr. An incision eight and one-half centimetres long, slanting inward, was made through the outer edge of the right rectus muscle. On opening the peritoneal cavity and retracting the edges of the wound, the right ureter was at once seen to be dilated to about the size of a lead-pencil. On following the dilated portion downward over the pelvic brim, it was found to end sharply in a hard body at a point one centimetre below the iliac vessels. An incision two and one-half centimetres long was made through the posterior peritoneum over the ureter, and the edges retracted with catch forceps. An incision three-quarters centimetre long was made in the ureter over the hard body after pinching up the ureter between the index-finger and thumb without loosening it from its bed. The stone had by this time slipped up the ureter for about two centimetres, but was easily rolled down and out of the ureteral incision by the fingers of the other hand. A single fine silk Halsted mattress suture was placed on the ureter, through its coats as far as the mucous membrane, and tied so as to invert the edges of the incision. The ureter was then buried behind the peritoneum again, by bringing the edges of the incised peritoneum together with a running suture of fine silk. The peritoneal cavity was irrigated with normal saline solution, and about one-half litre left behind. The abdomen was closed with a tier suture—one of fine catgut—for the peritoneum and muscles, a silver wire Halsted mattress suture for the fascia, and an intracutaneous catgut for the skin. No drainage was employed. The stone weighed 165 milligrammes (two and three-quarters grains), and was triangular in shape, one centimetre long, one centimetre wide at its base. It was very rough on the surface, reddish brown in color, with some whitish spots on its surface, and is probably a mixed uric acid, oxalate calculus.

She reacted well from operation, which lasted about forty-five minutes, her temperature the morning of operation being 99° F.; pulse, 98. Four ounces of urine were withdrawn by catheter and showed the following: Much free blood, acid. Microscopically, many red blood-cells, a few pus corpuscles, and chemically contained one-fourth by bulk of albumen. The next morning, May 9, 1900, there was very little blood present, urine much clearer, showing that the right kidney was probably in

good functionating order. The patient vomited considerably during the first few days, this being probably due to the early administration of Epsom salts. Urine examined May 10 showed the following: Smoky, acid reaction, trace of albumen, many uric and oxalate of lime and triple phosphates, some blood, pus, fine granular casts, bladder and ureteral epithelium. Note made May 16 states that she was having evening rises of temperature, 100.3° F. being the highest. Examination of the wound showed some suppuration in the catgut suture in the superficial fascia, which on evacuation produced an immediate fall of temperature to normal.

On May 30, 1900, there was present but slight amount of discharge of pus from wound, which is healed throughout except a small sinus. Patient is out of bed, appetite good, and expresses herself as feeling like a new woman. Urine examined to-day shows it to be pale in color, faintly acid, no albumen, a few triple phosphate and uric acid crystals, no oxalates, some squamous epithelium, and a few faintly granular and hyaline casts.

June 11, 1900.—Patient discharged from hospital to-day; wound entirely healed.

I am under obligations to Dr. F. L. Wood and Mr. F. X. Liedmayer for painstaking urine analyses.

[NOTE.—October 1, 1900. Patient called this day, perfectly well, and has gained much in strength and weight—about fifteen pounds—since leaving hospital.]